Curriculum vitae

Carlo Scotto was born in Orbetello (Italy) in 1965. He holds a degree of "Laurea in Fisica" (usually considered equivalent to a M.Sci in Physics) from the University of Rome (La Sapienza) and a PhD in Polar Science from the University of Siena. He attended a three-year Scholarship for Specialization in Geophysical Disciplines and is currently a senior researcher at INGV, the Italian National Institute of Geophysics and Vulcanology. He has taken part in two Antarctic campaigns and completed a research appointment at the University of Western Ontario (Canada) during the academic year 2009-2010. Other activities include studies on atmospheric gravity waves, sporadic E layer, irregularities in the F2 region, probability of occurrence of the F1 layer, and contributions to the International Reference Ionosphere model. He introduced a method for the inversion of ionogram traces and is the main author of the Autoscala software for the automatic interpretation of ionograms. To date he has published over 50 papers in peer-reviewed journals.

PERSONAL INFORMATION

orcid.org/0000-0002-9437-6775

Nationality: Italian

Date of birth: June, 24, 1965

- **EDUCATION**

1990 "Laurea in Fisica" equivalent to a Master of Science (Physics), Department of Physics, University of Rome "La Sapienza", Italy

2013 PhD, Doctoral School in Polar Science, University of Siena, Italy

- **CURRENT POSITION**

2003-present Senior Researcher at the Istituto Nazionale di Geofisica e Vulcanologia

- **PREVIOUS POSITIONS**

1996-2001 Researcher at the Istituto Nazionale di Geofisica e Vulcanologia, Italy.
2009 – 2010 Research Appointment at the University of The Western Ontario, London, Canada.

- **FELLOWSHIPS**

1993-1995 Fellowship "for Specialization in Geophysics", Istituto Nazionale di Geofisica, Rome, Itlay.
2010 Doctoral Scholarship, University of Canterbury, New Zealand (declined).
2010 Doctoral Scholarship, University of Siena, Italy (declined).

- **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

I supervised the following thesis for M.Sci. (Physics) at the University of Rome "La Sapienza".
1996 "Electron density oscillations in the ionosphere", Marco Pietrella.
1997 "Application of radio-technique to observe atmospheric gravity waves", Michael Pezzopane;
1997 "A study on the ionospheric plasma dynamics a by HF doppler shift measurements", Renato Barioli,.
1998 "Ionospheric electron density profiles from vertical radio-sounding", Andrea Drago,
1998 "Ionospheric plasma drift by Doppler shift measurements", Laura Scermino.
2000 "A study on the ionospheric plasma dynamics by the development of software for semiautomatic scaling of ionogram traces ", Daniele Brancato.
2001 "The probability of occurrence of F1 layer and L condition" Fulvio Cardinali.
2004 "Studies on F1 layer occurrence and application to the electron density profile models", Francesco di Paola.
I supervised the following thesis for M.Sci. (Physics), at the Università degli Studi di Roma Tre".
2014 - "Development of a 3D model with free parameters to characterize the ionospheric plasma", Dario

Sabbagh.

I supervised the following Ph.D Thesis at the Doctoral School in Polar Geophysics, University of Bologna, Italy.

2003-2005 - “A software for automatic scaling of ionograms”, Michael Pezzopane.

2013-2015 - “Oblique ionograms automatic scaling and eikonal based ray tracing”, Alessandro Ippolito

2013-2015 - “A multi-instrumetal approach to the study of the equatorial ionosphere over South-America”, Claudio Cesaroni.

- **TEACHING ACTIVITIES**

2008	International School of Space Science -Lectures on geomagnetism and Ionosphere, Aquila (Italy), April,7-12-). a lecture on "*Real Time Processing of Ionograms*".
2009	Istituto Nazionale di Geofisica e Vulcanologia - Lectures in the frame of the "*Course on Physics and Ionospheric Radio Propagation*" (a course lasting a week, for the armedforces personnel).
2010	Istituto Nazionale di Geofisica e Vulcanologia - Lectures in the frame of the "*Course on Physics and Ionospheric Radio Propagation*" (a course lasting a week, for the armed forces personnel).
2011	Istituto Nazionale di Geofisica e Vulcanologia - Lectures in the frame of the "*Course on Physics and Ionospheric Radio Propagation*" (a course lasting a week, for the armed forces personnel).
2011	Universidad Nacional de Tucumán - Facultad de Ciencias Exactas y Tecnología Post graduate curriculum on Space Geophysics, Course on: "The observation of the ionosphere by vertical radio soundings (30 hours).
2012	Istituto Nazionale di Geofisica e Vulcanologia - Lectures in the frame of the "*Course on Physics and Ionospheric Radio Propagation*" (a course lasting a week, for the armed forces personnel).
2013	*Third TRANSMIT summer school*, 1-5 July, 2013, Rome, Italy. A lecture on "The inversion of ionograms and electron density profile models".
2016-2017	Course on *Physics of the Magnetosphere and Ionosphere*, Department of Physics and Mathematics, Roma Tre University, Rome.
2017-2018	Course on *Physics of the Magnetosphere and Ionosphere*, Department of Physics and Mathematics, Roma Tre University, Rome.
2018-2019	Course on *Physics of the Magnetosphere and Ionosphere*, Department of Physics and Mathematics, Roma Tre University, Rome.
2019-2020	Course on *Physics of the Magnetosphere and Ionosphere*, Department of Physics and Mathematics, Roma Tre University, Rome.

- **INSTITUTIONAL RESPONSIBILITIES**

2014 –2018	Group Leader of Upper Atmosphere Physics Group of the Istituto Nazionale di Geofisica e Vulcanologia
2019 –present	Coordinator of the technical board *Observatories*.

- **EDITORIAL COMMITMENTS**

Referee for different journals (e.g.): *Adv. in Space Researc, Radio Sci., J. Atm. Sol. Q Terr. Phys.*

2011-2018 Associated Editor of *Annals of Geophysics*

2020-2021 Guest Editor of the Special Issue *Space Geodesy and Ionosphere*.

- **OTHERS**

2017 - He is qualified Associate Professor (Abilitazione Scientifica Nazionale, Settore Concorsuale

02/C1).

- **GRANTS**

Project Title	*Funding source*	*Period*	*Role*
Contract Change Notice No. 02 (D / 954 /67257328)	ESA	June 2017-December 2018	Head of INGV Team
ESA ITT No. AO/1-7699/13/D/MRP Space Situational Awareness Programme P2-SWE-1 Space Weather Expert Service Centres: Definition and Development	ESA	June 2015-January 2017	Head of INGV Team
AUSPICIO (Automatic Scaling of Polar Ionograms and Cooperative Ionospheric Observations)	The Italian National Program for Research in Antarctica	May 2014-May 2016	Principal Investigator
ESA Contract No. 4000112444/14/D/MRP for SSA-P2-SWE-VI SSCC OPERATIONS AND ENHANCEMENTS	ESA	November 2014- May 2015	Head of INGV team

- **SELECTED PAPERS**

Scotto C., Sabbagh, D. 2020. The accuracy of real-time hmF2 estimation from ionosondes. Remote Sensing.

Scotto C., Sabbagh D., 2020. Improvements in bottomside electron density definition in the Autoscala program, *Advances in Space Research*, 65 (5), 1432-1438.

C. Scotto, Ippolito A., Sabbagh D., 2019. A method for automatic detection of equatorial spread-F in ionograms, *Advances in Space Research*, 63 (1), 337-342.

Perrone L., Mikhailov A., Cesaroni C., Alfonsi L., De Santis A., Pezzopane M., ...**Scotto C**….. Long-term variations of the upper atmosphere parameters on Rome ionosonde observations and their interpretation, *Journal of Space Weather and Space Climate*, 7, A21.

Ippolito A., Altadill D., **Scotto C.**, Blanch E., 2018. Oblique Ionograms Automatic Scaling Algorithm OIASA application to the ionograms recorded by Ebro observatory ionosonde, *Journal of Space Weather and Space Climate*, 8, A10.

Sabbagh D., **Scotto, C.**, Sgrigna, V., 2016. A regional adaptive and assimilative three-dimensional ionospheric model. *Adv. Space Res*. 57 (5), 1241-1257.

Ippolito, A., **Scotto, C.**, Sabbagh, D., Sgrigna, V., Maher, P. , 2015. A procedure for the reliability improvement of the oblique ionograms automatic scaling algorithm. *Radio Sci.*, 51, 454–460doi:10.1002/2015RS005919.

Scotto C. , 2015. Triple splitting and z-rays in polar ionograms. *Antarctic Science*. 27(4), 383-387doi.org/10.1017/S095410201400090X.

Cesaroni, C., Spogli, L. , Alfonsi, L., De Franceschi, G., Ciraolo, L., Monico, J.F.G, ...**Scotto,C.**, …L-band scintillations and calibrated total electron content gradients over Brazil during the last solar maximum,
Journal of Space Weather and Space Climate 5, A36.

Ippolito, A., **Scotto, C.**, Francis, M., Settimi, A., Cesaroni, C. , 2015. Automatic interpretation of oblique ionograms. *Adv. Space Res.* 55(6), 1624-1629.

Chartier, A. T., Kinrade, J., Mitchell, C.N., Rose, J.A.R., Jackson, D.R., Cilliers, P. ,… **Scotto, C.**, 2014. Ionospheric imaging in Africa, *Radio Sci.*, 49 (1), 19-27.

Scotto, C. , 2013. The accuracy of data from ionosondes for the estimation of hm F2 and the identification of global change in the ionosphere, Advances in Space Research 52 (4), 569-574doi:10.1016/j.asr.2013.04.007.

Pezzopane M., **Scotto C.** , 2013. Massive statistical analysis of autoscaled data: The case of the double reflection signature in mid-latitude vertical ionograms, , Journal of Atmospheric and Solar-Terrestrial Physics 97, 43-49.

Scotto C., Settimi A., 2013. The effect of collisions in ionogram inversion Advances in Space Research, 51 (5), 697-701,.doi: 10.1016/j.asr.2012.09.033.
Scotto, C., Macdougall, J., 2012. Application of Autoscala software to the Canadian advanced digital ionosonde, International Journal of Remote Sensing, 33 (17), 5574-5582.

Pietrella, M., Pezzopane, M., **Scotto, C.**, 2012.Variability of foF2 over Rome and Gibilmanna during three solar cycles (1976-2000), Journal of Geophysical Research: Space Physics (1978–2012) 117 (A5).

Scotto, C., Pezzopane, M., 2012. Automatic scaling of polar ionograms, Antarctic Science 24 (01), 88-94.

Scotto, C., Pezzopane, M., Zolesi, B., 2012. Estimating the vertical electron density profile from an ionogram: On the passage from true to virtual heights via the target function method, Radio Science 47 (1).

Scotto, C., 2011. Estimation of probability of occurrence of F1 layer or L condition using tables and electron density profile models, Advances in Space Research 48 (12), 2053-2056.

Pezzopane, M., **Scotto, C.**, Tomasik, Ł., Krasheninnikov, I. , 2010. Autoscala: an aid for different ionosondes, Acta Geophysica 58 (3), 513-526.

Scotto, C., 2009. Electron density profile calculation technique for Autoscala ionogram analysis, Advances in Space Research 44 (6), 756-766.

Altadill, D., Boska, J., Cander, L.,R., Gulyaeva, T., Reinisch, B., W., Romano, V., **Scotto C.**, 2009. Near Earth space plasma monitoring under COST 296, Annals of Geophysics 52 (3-4), 221-234.

Scotto, C., Pezzopane, M., 2008. Removing multiple reflections from the F2 layer to improve Autoscala performance, Journal of Atmospheric and Solar-Terrestrial Physics 70 (15), 1929-1934.

Pezzopane, M., **Scotto, C.**, 2008. Can the polarization tagging of the ionogram trace deceive autoscaling methods? The Learmonth case, Annals of Geophysics 51 (4), 597-607.

Pezzopane, M., **Scotto, C.**, 2008. A method for automatic scaling of F1 critical frequencies from ionograms, Radio Science 43 (2).

Pezzopane M., **Scotto, C.**, 2007. Automatic scaling of critical frequency foF2 and MUF (3000) F2: A comparison between Autoscala and ARTIST 4.5 on Rome data, Radio Science 42 (4).

Scotto, C., Pezzopane, M., 2007. A method for automatic scaling of sporadic E layers from ionograms, Radio Science 42 (2).

Pezzopane, M., Zuccheretti, E., Bianchi, C., **Scotto, C.**, Zolesi, B., Cabrera, M., A. , 2007. The new ionospheric station of Tucumán: first results, Annals of Geophysics.

Pezzopane, M., **Scotto, C.**, 2005. The INGV software for the automatic scaling of foF2 and MUF (3000) F2 from ionograms: A performance comparison with ARTIST 4.01 from Rome data, Journal of atmospheric and solar-terrestrial physics 67 (12), 1063-1073, 38.

Scotto, C., 2002. The probability of occurrence of F1 layer or L condition estimated by tables, Advances in Space Research 29 (6), 987-992, 1.

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Scotto, C., de Gonzalez, M. M., Radicella, S. M., Zolesi B., 1997. On the prediction of F1 ledge occurrence and critical frequency, Advances in Space Research 20 (9), 1773-1775, 11.

Scotto, C., 1995. Sporadic-E layer and metereological activity. *Annali di Geofisica*, 38/1, pp21-24.